

THE SCIENTIFIC KNOWLEDGE
OF DANTE

D. LLOYD ROBERTS

A xxxvii

20/2

Galleas

CUC.D



22101290553


X 44155

To the Right Reverend William

Boyd-Carpenter DD with the Author

Kind regards

14 Mch 1914



Digitized by the Internet Archive
in 2017 with funding from
Wellcome Library

<https://archive.org/details/b28983932>

THE SCIENTIFIC KNOWLEDGE
OF DANTE

SHERRATT & HUGHES

Publishers to the University of Manchester

Manchester : 34 Cross Street

London : 33 Soho Square, W.

THE SCIENTIFIC KNOWLEDGE OF DANTE

*A Lecture delivered at the Victoria University of Manchester
before the Members of the "Manchester Dante Society"*

BY

D. LLOYD ROBERTS, M.D., F.R.S.E., F.R.C.P.

MANCHESTER
AT THE UNIVERSITY PRESS

1914

NTE ALIGHIERI (1265-1321)

Galleri

CUC. D



The Scientific Knowledge of Dante.

L'un de' famigliari
di quel sommo Ippocrate.

Purg. XXIX, v. 136-7.

IN May, 1265, was born in the city of Florence—the most illustrious of its many illustrious citizens—Dante Alighieri, poet, philosopher, and physician; but we have it on the authority of Dante himself that he simply desired to be designated “poet.”

Dante was a member of a patrician family (he prided himself on having descended from a noble family of old (in *Paradiso XVI.*)), and as such, according to the laws of Florence, he could not hold any public office. We know that before a Florentine could be admitted to Citizenship, so as to qualify him for civic and other public duties, it was necessary that he should be enrolled as a member of one of the great guilds of the city. Dante relinquished whatever privileges ancestry conferred upon him, in order to seek admission to one of these guilds.¹

His choice fell upon the Guild of Physicians and Apothecaries, the craftsmanship of which he knew the most.² Signor Fraticelli, the biographer of

1. Says Carducci, however (“Opere,” Zanichelli, Bologna, Vol. I., page 101), when Dante was exiled by the Oligarchy: “*in lui risorse l'antico aristocratico.*”

2. Carducci (*ibid*, page 102), says, “*Dante per amor della patria s'era fatto speziale.*”

6 THE SCIENTIFIC KNOWLEDGE

Dante, says that he saw the codex in the State archives, and on folio 47 he read the inscription :—

“DANTE DEGLI ALIGHIERI, POETA FIORENTINO.”

Apothecaries' establishments were distributed over the city, and were probably under the supervision of the guild and its officers, as they were at a later period in England. Not only were drugs and chemicals vended, but also precious stones and books, so when a philosopher or other learned man wanted to see any new book that had reached the city, it was at the apothecaries' shops that he would expect to find it. Consequently, these stores became places of meeting and resort for the learned and scientific in their daily peregrinations, and this practice holds good in Italy to the present day.

The apothecaries, being chemists or alchemists, were regarded as authorities on precious stones, and as such would be consulted by the people as to the genuineness or otherwise of gems submitted to them ; and they were also experts in the fabrication of imitations of the genuine articles.

In the beginnings of medicine, the physician not only prescribed medicines, but prepared and compounded them, afterwards distributing them to his patients, though later, these latter duties were delegated to the apothecaries, the physician finding ample employment in the more studious and scientific side of his profession.

It is recorded that Dante, on one occasion, visited an apothecary's shop, and, as it is customary in Italy, he took a seat on a bench outside. A book was handed to him which he had searched for in vain for years, and he became so deeply engrossed in it that he was oblivious to everything except the subject of his study. At the time a fête was in progress in the city, causing much excitement and commotion in the street, and when a friend enquired if the noise had not disturbed him, he received the almost incredible reply: '*No, I have heard nothing of it.*' Similarly our own Newton, when he was absorbed in his deep studies, by which he revealed to us wondrous scientific truths, never noticed what was taking place in his immediate surroundings. In the age and time of Dante, perhaps the greatest seat of learning was the University of Bologna, (at this time spoken of as the "Studium"), completely equipped as it undoubtedly was in all departments of art, letters, science and medicine. To this great centre Dante naturally repaired, where, although he had already achieved some fame as a poet, he was accorded no special welcome, which is perhaps accounted for by the fact that he had gone there solely for the purposes of study.

At Bologna, as indeed in all the universities of the middle ages, medical education was held to consist of a knowledge of the seven liberal arts: grammar, logic, rhetoric, music, arithmetic, geometry and astronomy; in fact, before anyone could

8 THE SCIENTIFIC KNOWLEDGE

apply himself to the practice of medicine, he must have shown himself acquainted with the various sciences.¹

We have it on the authority of Villani and Boccaccio that Dante studied at Bologna, and although the author of the “Decameron” has been regarded of late as a romancer, somewhat unjustly I think, the numerous, and I would say minute and precise allusions to Bologna in the “Divine Comedy” and the “Vulgari Eloquio” must convince us, not only that the poet visited the famous city, but that he resided in it for a considerable time. Dr. Corrado Ricci, in his essay, “Dante allo studio di Bologna,” proved conclusively that Dante was at Bologna, and thinks that the poet was there in 1287 when a young man of twenty-two, and again after his exile. Along with other subjects, doubtless, he would study anatomy, as we have it recorded that at this time anatomy was taught by means of lectures and dissections, and it is positively known that in 1315 Mondinus (Raimondo Licci) practised dissections on the bodies of two women at Bologna and wrote a work on anatomy containing a description of the human body, with illustrations drawn from nature.

It was not till the second half of the XII century that teachers of medicine assumed the title of “Doctor” or “Professor,” or that graduations can be shown to have taken place, and the school

1. See Dr. Paget Toynbee’s “Dante Dictionary,” under “Trivium” and “Quadrivium.”

of medicine was then first organised after the fashion already established in the schools of law and arts. Degrees were conferred at this time by the University of Bologna, and it is most probable that Dante graduated after passing the usual examination on the completion of his studies ; and there can be little doubt, that he owed his scientific knowledge and profound acquaintance with the different departments of medicine to the training he received there.

In the second decade of the XII century, a decree was promulgated by Pope Honorius III, that no priest should practise dissections, and, as a necessary consequence, medicine and theology were divorced from this time. The reason for this decree appears to have been that the study of medicine diverted the priests from their theological and other professional duties, and the rule was so strictly enforced, that the priests were not allowed to absent themselves from their duties under any circumstances for more than two months at a time.

“It is worthy of note,” says Dr. Rashdall, “that one of the first academically trained physicians who taught at Bologna, was Nicholaus of Farnham, who, after teaching art in Paris and Oxford, professed medicine at Bologna, and afterwards became Bishop of Durham in 1241.” The foundation of a Scientific School of Medicine at Bologna is generally associated with the name of Taddeus of Florence, called by Villani, “*il sommo Fisiziano*” and accounted the greatest Hippocratic physician in Europe at the

time, and who began to teach in the city about the year 1260. Dante incidentally mentions his name in *Paradiso*, *XII*, lines 82 and 83. Marvellous stories (Professor Rashdall tells us) were told of Taddeus' wealth and professional exactions. He received 3,000 libræ to attend a patient at Modena, and he would not go to Rome to attend the Pope for less than 100 golden ducats *per diem*, arguing that as the Pope was the most exalted sovereign on earth, His Holiness should be charged accordingly. On the other hand, we know that in his will he bequeathed large sums of money to the poor, and did not forget his pupils who had gained renown in the medical art. Taddeus wrote learned treatises in Latin; he held, however, the vernacular in such respect that he translated the ethics of Aristotle into Italian. Dante somewhat severely criticises this translation in the *Convivio*.¹

Del Virgilio, too, was a professor at the Studium of Bologna, say Wicksteed and Gardner in their work on "Dante and Giovanni del Virgilio": "He had earned the cognomen, 'del Virgilio,' by the success of his expositions or imitations of the old masters." "He was on terms of intimacy with Dante, and was filled with admiration for his genius; but he was not in the least reconciled to his bold departure from literary tradition in the subject of his poem, and, above all, in the medium in which he expressed himself (i.e. the mother tongue)." Del Virgilio, in the first Eclogue,

1. Treatise 1, Chap. X., lines 70 and 71, Oxford Edition.

urges Dante to write a poem in Latin, so that he might, with great ceremony, be crowned a poet at the Studium of Bologna; but the poet declined the *Laurel Crown* under such conditions, as he still cherished the hope of returning to his beloved Florence; indeed, it was said that the word "Florence" was engraven on his heart.¹ This is somewhat similar to what Browning said of himself in his poem "De Gustibus," "See my heart, and you will see graved inside of it 'Italy.'"

When Dante had completed what he regarded as his curriculum, it is most probable that he visited Paris. Paris (Parigi, Parisi) is mentioned by Dante several times both in the Rime (Rhymes) and in the "Divine Comedy." In *Purgatorio XI*, the poet says of Oderisi da Gubbio the famous illuminator:

. . . *l'onor di quell' arte*

che alluminare è chiamata in Parisi,

(that art, which in Paris is called illumination).

Paris, in fact, in the middle ages, was the centre of the production of illuminated MSS. In *Paradiso X*, line 137, speaking of Sigieri de Brabant, a scholar of the XIII century, Dante says: 'that he taught philosophy in the University of Paris, situated in the '*Vico degli Strami*' (Rue du Fouarre); thus showing that the poet must have frequented that seat of learning since he locates it with such great precision.

I can quite conceive, and give credence to the

1. He says in "De Vulgari Eloquentia," 1st Book: "*Florentiam adeo diligamus ut, quia dileximus, exilium patiamur iniuste.*" (Oxford Edition, lines 20-21).

12 THE SCIENTIFIC KNOWLEDGE

assumption that from Paris Dante passed on to the University of Oxford (I refer my readers to Dr. Axon's careful study, "*Dante's British Allusions*"), then enjoying a high reputation among the seats of culture, largely due to the influence and profound learning of the Franciscan Order, to which all Europe was flocking on account of its renown in the faculties of science, theology and medicine.

I now propose, briefly, to discuss a few of the scientific subjects that Dante must have studied, and with such marvellous results. His intimate acquaintance with the phenomena of mind and matter is repeatedly shown in his works, by allusions to the hidden workings of the processes of nature, which he elucidates with all the prophetic vision of genius endowed with an intelligence well nigh omniscient, and capable of interpreting the fundamental principles which underlie Nature's manifestations. To this end does he place under contribution the collective knowledge of his epoch, comprising medicine, (which of course includes pathology, embryology, and physiology,) psychology, zoology, botany, astronomy and physical geography, as well as, incidentally, the arts of music and painting.

In our time, when knowledge is increased so much that every branch of science yields countless sub-divisions, acquaintance with each of which demands the devotion of a lifetime, it would be quite impossible for the greatest genius to attain even an elementary knowledge of every branch of science; but in Dante's day this was not so

difficult of accomplishment by an earnest student ; consequently, the well-educated Statesman, Artist, Physician and Scholar were more or less conversant with all the sciences, the possession of such general knowledge being an indispensable equipment for their particular calling. As in the City of Florence it was the law that no one could engage in any public office in connection with the State before the age of 30 years, there was ample time for the intellectual and persevering student to become master of the various sciences—a mastery fully acquired by Dante, as shown in his works.

That Dante made a special study of medicine, and in particular of pathology, is evident throughout his works : The *Inferno*, *Purgatorio* and *Paradiso*, the *Vita Nuova*, and *Convivio*. In INFERNO iv, 118 and 119, the poet mentions that in the Limbo, on a green sward (*verde smalto*), he saw amongst “ *gli spiriti magni* ” (mighty spirits) Hippocrates and Galen.

A careful study of the works mentioned, has given me the impression that if the Poet had devoted himself wholly to medical science his name would have come down to us as one of its greatest exponents. As it is, in his delineations of some of the fundamental principles of science, he astonishes us with his penetration, perspicacity, and his breadth of knowledge. In many instances, in propounding scientific truth, as in discoursing on the various diseases that afflict the condemned spirits in Hell, he is so accurate in his description

14 THE SCIENTIFIC KNOWLEDGE

that, as Professor Segrè, of the University of Rome, affirmed in his lecture before the Manchester Dante Society, "The poet may indeed be said to put to shame the most learned nosological treatises of the present time."

Let me quote a few instances:

In the first canto of the *INFERNO*, lines 19—20, the poet, describing how he escaped from the wild beast (*la lupa*) says :—

*Allor fu la paura un poco queta,
che nel lago del cor m'era durata.*

Then my fear was somewhat quietened, which had continued in the lake of my heart.

(Dr. Carlyle).

Here the poet gives us a physiological definition in which he may be said to have adumbrated, not of course forestalled, Harvey's wondrous discovery of the circulation of the blood.

Again, in the II canto, line 15, in alluding to Virgil's statement in the *Æneid* that Æneas had visited the nether world, the poet says of him :—

. . . . e fu sensibilmente, (i.e. in the body)

a definition of the Sensorial, so accurate and scientific that it could be set as a thesis for a candidate sitting for his examination in physiology.

We also find a hint of pathology in :—

ella (the beast) mi fa tremar le vene e i polsi;
(she makes my veins and pulses tremble);

Thus showing that the poet was imbued with the

principle of science acquired in the University of Bologna.

It is interesting to note the extreme simplicity of the remedies employed by physicians in the time of Dante as contrasted with the poli-pharmacy that was rampant in a later century, when the prescriptions were not only remarkable for the multiplicity of the ingredients, but perhaps even more so for their fantastic and often disgusting character. The XIV century seemed to have reverted to those empiric remedies to which Dr. Casartelli, the Bishop of Salford, alluded in his second lecture on "Medical and Ethical Science in ancient Iran," at the University of Manchester, March 24th, 1909.

I shall endeavour to illustrate the simple nature of the remedies used in the time of Dante, as suggested by the poet himself in his "Divine Comedy," and how wonderfully efficacious they were, and, in many instances, how applicable to the ailments and disorders of the present day. For instance, at the end of chapter IX of the third treatise of the *Convivio*, the poet says:—

. *Although greatly overtaking my sight by studious reading, I so weakened the visual spirits (spiriti visivi), that the stars all appeared to me to be discoloured by a kind of white haze and, he continues, by giving the eyes a long rest, in dark and cool rooms, and by cooling the ball of the eye with pure water (acqua chiara)—“sterilized*

water" as we now call it—*I regained the power that had been dispersed, so that I recovered the former healthy condition of the sight.*

(Jackson).

What a simple and effective remedy! Is it not practised to this very day? Indeed, I am not so sure that there was not more of rampant superstition in later days, as evidenced by the divinations, sorceries, charms and witchcraft, than there was in the period under our review.

TWO INSTANCES OF EPILEPSY. (Fainting fit).

INFERNO, Canto III, lines 134—136.

*. . . Balenō una luce vermiglia
La qual mi vinse ciascun sentimento :
E caddi, come l' uom cui sonno piglia.*

A crimson light flashed, which conquered all my senses, and I fell like one who is seized with sleep. (Carlyle).

INFERNO, Canto V, lines 140—142.

*. . . Di pietade
Io venni men sī com'io morisse ;
E caddi, come corpo morto cade.*

I fainted with pity, as if I had been dying, and fell as the dead body falls. (Carlyle).

CONSCIOUSNESS REGAINED.

INFERNO, Canto IV, lines 1—3.

*Ruppemī l' alto sonno nella testa
Un greve tuono, sī ch' io mi riscossi
Come persona che per forza è desta.*

A heavy thunder broke the deep sleep in my head, so that I started like one who is awakened by force. (Carlyle).

EFFECTS OF INTENSE GRIEF. INFERNO, VI, 91—93.

*Gli diritti occhi torse allora in biechi,
Guardommi un poco e poi chinò la testa;
Cadde con essa al par degli altri ciechi.*

Therewith he writhed his straight eyes askint, winked at me a little, then bent his head and fell down with it like his blind companions. (Carlyle).

PHYSIOLOGY. (Optics).

INFERNO, Canto IX, lines 73—74.

*. . . Or drizza il nerbo
Del viso su per quella schiuma antica.*

Now turn thy nerve of vision on that ancient foam.¹

FEVER SYMPTOMS.

INFERNO, Canto XVII, lines 85—87.

*Qual è colui che ha sì presso il riprezzo
della quartana c' ha già l'unghie smorte
e trema tutto, pur guardando il rezzo.*

As one who has the shivering of the Quartan so near that he has his nails already pale, and trembles all still looking on the shade.

PHYSICS. Phenomenon scientifically described.

INFERNO, Canto XV, lines 2—3.

*Il fummo del ruscel di sopra aduggia
Sì che dal fuoco salva l'acqua e gli argini.*

The exhalation of the rivulet quenches all the flames above it, etc.

1. See also *Paradiso*, XVI, 70-72.

18 THE SCIENTIFIC KNOWLEDGE

PATHOLOGY. Malaria and other diseases.

INFERNO, Canto XXIX, lines 46—48,

. *spedali*
di Val di Chiana tra Luglio e Settembre
E di Maremma e di Sardigna i mali.

The hospitals of Val di Chiana between July and September, and of Maremma and Sardinia, all the maladies prevalent in those regions.

METEOROLOGY. A tempest; how it is caused : disequilibrium of atmosphere.

INFERNO, Canto IX, lines 67—72.

Non altrimenti fatto che d'un vento
impetuoso per gli avversi ardori,
che fier la selva e senza alcun rattento
li rami schianta, abbatte e porta fōri :
dinanzi polveroso va superbo
e fa fuggir le fiere e li pastori.

A sound as of a wind impetuous for the adverse heats, which smites the forest, and, without any stay, shatters off the boughs, beats down and sweeps away, dusty in front it goes superb, and makes the flock and the shepherd flee.¹ (Carlyle).

AERONAUTICS.

INFERNO, Canto XVII, lines 115—117.

Ella sen va notando lenta lenta,
Ruota e discende ; ma non me n'accorgo,
Se non ch' al viso, e disotto mi venta.

He (Geryon, the monster) goes swimming slowly, wheels and descends, but I perceive it

1. See also *Paradiso*, XXXI, 73-75.

not, otherwise than by a wind upon my face and from below.

It must be remembered that Dante and Virgil are riding the monster who conveys them down to the 8th circle. This (XVII) is a magnificent canto, and Dante may indeed be said to be one of the forerunners of the art of aeronautics, which has of late made such wondrous strides.

In Cantos XXI—XXV in particular, the supreme art of Dante is made manifest, and, in fact, the whole plan of the “Divine Comedy” is essentially scientific, and transcends human imagination.

In Canto XXXI, INFERNO, Dante defines the principles of Evolution, when in describing the giants who towered above the rampart that encompassed the pit, he says :—

Surely Nature did very right when she abandoned the art of making living beings of such vast proportions, for, where the faculty of the mind is joined to evil intent and to power, the race of men can make no defence against it.

Finally, in Canto XXXIV, the last of the INFERNO, lines 110 and 111.

*. . . . Tu passasti il punto
al qual si traggon d'ogni parte i pesi.*

Thou did'st pass the point (the centre of the earth) to which all gravities from every side are drawn.

20 THE SCIENTIFIC KNOWLEDGE

Whilst Dante *defined*, Newton *established* the theory of the law of gravitation.

EMBRYOLOGY.

Before I deal with Dante's wondrous dissertation on Embryology, I must refer my readers to Chaps. XXI to XXIII (inclusive) of Treatise IV, of the *Convivio*, which are, so to speak, a prelude to the scientific doctrines enunciated in Canto XXV of the *Purgatorio*, lines 37—108 inclusive. We must not forget that Dante's early works, as Professor Herford told us in his comment on Mr. Whitehead's paper on the *Convivio*, are a preparation to that Trilogy in which, as the poet affirms: *pose mano, e cielo e terra*.

Says Dante:—

When the reproductive element falls into the matrix, it carries with it the virtue of the generating soul, and the virtue of the Heaven, and the virtue of the elements bound up in it, that is to say, its completion; and it ripens and adapts the material to receive the formative virtue which is given by the soul of the generator.

Commenting on the above Canto, Benedetto Varchi says that the poet wishing to discourse on the power of generation, first he defines the properties of the sperm in the manner of a "Medico," and gives a dissertation in which he shows:

quanto sia la scienza e quanto l'arte di questo poeta e filosofo.

(How consummate is the art and the science of this great poet and philosopher).

Dante, as is known, puts into the mouth of Statius, a dissertation on the generation of the vegetative and sensitive soul, both of which are evolved out of the potentiality of the substance. The Latin poet ends by demonstrating how the embryo from being a mere animal becomes endowed with a rational soul :

. *si move e sente*
Come FUNGO MARINO ; ed indi imprende
Ad organar le posse ond 'è semente.

It moves and feels as does a SEA-FUNGUS, and after that it undertakes to organise the powers of which it is the germ. (W. Warren Vernon).

Is it too much to say that by this definition Dante forestalled modern scientific truths ?

As Dr. Barlow, the eminent Dante scholar observes : “ To appreciate the physiological science shown by Dante, in his masterly résumé of the formation and development of a human being, from the first mysterious movings of embryonic life to the completion of the foetal economy and the birth of an immortal soul, we must go back to that period when little or nothing more was known of the function of generation than what had been said by Aristotle, and repeated by his commentator Averrhoës. ”

Benedetto Varchi, that encyclopædic man of the “ Cinquecento,” who, like Boccaccio, was charged

22 THE SCIENTIFIC KNOWLEDGE

later by the Florentines to comment publicly on the “Divine Comedy,” in his dissertation on *Purgatorio* XXV, calls Dante “one of the greatest physicians that the world ever saw.”

In many other branches of science Dante’s pre-science is marvellously demonstrated throughout his works.

In Canto V of the *Purgatorio* for example, Buonconte da Montefeltro, relating how his body was borne away by the overflowing of the stream near which he lay, the poet explains the phenomenon of the rain thus :—

*Thou know’st how in the atmosphere collects
That vapour damp, returning into water
Soon as it mounts where cold condenses it.*

The theory of rain-production could not have been more clearly and tersely expressed in a modern text book dealing with the scientific explanation of natural phenomena. ¹

References to botany (flowers and plants in general) are numerous in Dante’s works, and several appropriate passages could be quoted from the “Divine Comedy,” well-known to many of my readers, and showing the poet’s accuracy and inner knowledge of the subject.

1. Dr. Leynardi in his work on “La psicologia dell’ Arte nella D.C.” speaks of “i fenòmeni dell’ aria, dipinti (da Dante) con maestria”

Just to mention one very striking example in the *Purgatorio*, Canto XVI, line 114 :—

. . . *Ogni erba si conosce da lo seme.*

(Every herb is known by its seed).

In the ethical sense, St. Matthew says :—

Ex fructibus eorum cognoscetis eos.

Professor Visiani of Florence goes so far as to say that this conception is the same on which is founded the distinction of all the plants, in the method now adopted to classify them, following which, plants are divided into various primary groups according to the character of the embryo, which is the essential part of the seed.

The principle propounded by Dante, and applied to the science two centuries later by Cesalpino, the Tuscan, furnished in the XVIII century the basis for that method of classification which, conceived as it was by the Brothers Jussieu, the great French naturalists, goes under the name of the “Natural Method.” Barlow alludes to the interesting fact in vegetable physiology that flowers are only metamorphosed leaves ; this discovery is commonly attributed to Goethe, but it was first observed by Dante, and expressed by him (*Purg.* XXXII, l. 39) in these words :—

. . . *fiori e . . altra fronda.*

(Flowers and other leaves).

The sweet Mantuan poet, whom Dante calls “il mio Dottore,” was himself a keen observer of nature (V. particularly the *Georgica*). The people of the Middle Ages, as Professor Comparetti tells us in

24 THE SCIENTIFIC KNOWLEDGE

his “*Virgilio nel Medio Evo*,” attributed to him wonderful powers, amongst which was that of curing loathsome diseases.

That Dante made profound studies in astronomy, is inferred from the cosmography of the “*Divine Comedy*,” one of the grandest conceptions that the human mind ever imagined.

Very numerous are the references to this branch of science, not only in the immortal poem, but also in the *Convivio* and *Vita Nuova*. The subject has been dealt with exhaustively by Dr. Moore in his *Studies*, 3rd series, pages 1—108. I must therefore refer my readers to that volume where they will obtain a mass of information.

“It is a matter of regret,” says Dr. Moore, “that even students of ability and culture often refuse so much as to attempt to understand Dante’s astronomical references.”

GEOGRAPHY.

Those who have read carefully the “*Divine Comedy*” cannot fail to have been impressed with the accuracy with which Dante describes the Geographical features of Italy, nay Europe, and of the then known world.

Of a scientific treatise on Physical Geography, by Dante, I must make mention. When Father Moncetti brought out in 1508 the *Quæstio de Aqua et Terra*, professing to be a lecture delivered by Dante in the Church of Sant’ Elena, at Verona, its authenticity was not seriously called

in question. In the latter part of the XVIII century, when a revival in the study of Dante was apparent, its genuineness began to be disputed. In the last decade, however, men of great weight have reconsidered the problem, with the result that, if they do not implicitly believe in its genuineness, they will not discard it until further proofs of its forgery is forthcoming. Dr. Moore, in his "Studies in Dante," (3rd series, page 303), frankly confessed that, although he at one time admitted the spuriousness of Dante's lecture, nevertheless, in reviewing the proof sheets of his edition of "Tutte le Opere di Dante Alighieri" he was struck with the ring of genuineness about it, and the thoroughly Dantesque character, not only of the arguments themselves, but of their form and the details of the language. Of late, an Italian professor, Dr. Vincenzo Biagi, in an exhaustive work, comes forth with quite an astounding array of arguments in its favour. The question, let it be remembered, is, "Can water, in its own space or natural circumference, be in any place higher than the dry or habitable part of the earth?" Dante's answer is in the negative. Although it cannot be said that Dr. Biagi has proved conclusively the authenticity of the *quaestio*, yet an advance towards it has been made. Another significant fact is, that the majority of English Dante scholars are now against the notion that the work is spurious.

26 THE SCIENTIFIC KNOWLEDGE

ARTIST.

We may surmise that Dante was an artist of no mean distinction; it is, in fact, recorded in the *Vita Nuova* that the poet was drawing the figure of an angel on a tablet when some friend unexpectedly called to see him. Browning dwelt with complacency on this point in the introductory lines of "One word more": "*Dante once prepared to paint an angel.*"

One of Dante's earliest and most steadfast friends was Giotto, equally great as painter, sculptor, and architect, who sketched that beautiful fresco-portrait which was uncovered and presented to the view of the citizens of Florence, in the Bargello in 1840. Doubts have been expressed as to whether Giotto actually painted the portrait: this is indeed an age of systematic demolition and negation. It is a source of great satisfaction to know that an Englishman, Baron Seymour Kirkup, was the chief instrument in this discovery. (See Monograph: "La Maschera di Dante," by Senator D'Ancona.)

Dr. Cossio, in his book: "Art in Dante," traces the influence which the "grete poete of Itaille," as Chaucer called him, exercised on the fine arts, and proves by an array of facts that in Dante's works we find evidence of such extensive architectural skill, that we are compelled to acknowledge that he must have possessed an extraordinary acquaintance with this branch of art. As my readers will remember, Carlyle, in his "Heroes and Hero-

worship," insists on the "architectural harmony" that reigns in the great poem; whilst Longfellow, in his "Sonnets" on the "Divine Comedy" compares it to a vast minster.

Dante, in his youth, greatly delighted in the art of music.¹ Boccaccio says of him in his "Vita": "*sommamente il poeta si diletto in canti e suoni nella sua giovinezza.*" The musicality of Dante's poem is a sure proof that he must have devoted many years of study to this art. Signor Bonavia, in his lecture on "Music in Dante's time," tells us that in mediæval times there were two distinct schools, "one devoted to combining sounds, thus paving the way to harmonies, and the other a popular growth, giving expression to some internal desires for song repeating, guided not by art but by natural instinct." "That Dante was perfectly acquainted with both systems, the harmonic and the monodic," continues Sig. Bonavia, "is shown in many passages of the 'Divine Comedy,' and in the other works of the poet."

I have thus endeavoured to place before my readers a few scintillations from the refulgent splendour of Dante's intellectual gifts. I have not presumed to discuss his poetic genius, that genius before which the whole world unites in one lasting pæan of

1. Mr. Collmann in his lecture on "Francesca da Rimini," at Manchester University, gave an exhaustive list of the various passages in the "Divine Comedy" which had been set to music by great composers.

28 THE SCIENTIFIC KNOWLEDGE

admiration, but have only directed their attention to the fact that, in addition to being a poet of the first magnitude, Dante was a many-sided and learned man. He could temper the abstruse deductions of science to his own use, clothing in poetic imagery the results of crude observations, transforming them into beauteous similes, as by the skill of the lapidary, the precious stone with its native dulness is converted into a gem of the first water. Throughout many of the great poet's Cantos these transfigured fragments of science, like gorgeous-hued inlays of mosaic, form lustrous stars, irradiating with intrinsic beauty, pregnant with hidden meaning.

